

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Apparatus for Coating Sausage Portions, Joints of Meat and other Meat Products

I, PAUL HELMUT HILGELAND, a citizen of Germany, of 2, Townsend Avenue, London, N.14, do hereby declare the invention for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to apparatus for providing meat products with edible artificial skins and to the use of such apparatus. Particular embodiments of the apparatus of the invention may be used for covering preformed sausage portions and meat products such as chops and other small joints of meat, with edible artificial coatings. Other embodiments may be used for making sausages with such skins from bulk sausage meat. It will be understood that the term "meat products" is used herein for brevity to include fish products, and materials such as fish fillets and fish fingers can be treated in the apparatus of the invention in much the same way as similarly shaped meat products.

The apparatus of the invention is especially advantageously used for the automatic production at relatively high speed of sausages having artificial skins. In recent years skinless sausages have become increasingly popular. They possess the advantages over sausages with skins of being free from a relatively tough outer covering, and of being free from a tendency to burst while being cooked. Moreover it is very difficult effectively to sterilize the traditional type of sausage skin (i.e. that derived from cattle, sheep, or pigs' intestine) and the presence of bacteria in the skins considerably shortens the shelf-life of the sausages made from them. In addition skinless sausages are free from the undesirable flavour normally associated with the traditional type of sausage skin. However, skinless sausages have the disadvantage they they are partially cooked

during production, so that they cannot subsequently be considered quite fresh. In addition the use of a skin which is subsequently removed, as in some methods of making skinless sausages, leads to higher costs and relatively slow rates of production. Moreover, the absence of a skin causes the sausage to lose more fat and meat juice during cooking than does a sausage having a skin.

Sausages produced using the new apparatus are substantially free from these disadvantages, and, when covered with a calcium alginate skin in accordance with this invention, have their whole surface including their ends sealed, a result which cannot be obtained in conventional processes of manufacture of sausages with or without skins.

The apparatus of the invention may also be used for covering cuts of meat and fish with an edible hygienic skin of calcium alginate, which is particularly useful when the meat or fish is to be sold prepacked, as in a "supermarket". The skin protects the wrapped material from drying out and from dirt, and is more hygienic in itself. If appropriate steps are taken, the skin may be formed in a sterile condition.

The present invention provides apparatus for covering shaped sausage portions and other meat products with edible artificial skins comprising means for coating the products with a solution of an edible coagulable substance, means for treating the coated products with a coagulating agent, means for drying the products with coagulated coatings, and a conveyor system positioned to receive the products initially and to convey the products during the aforesaid coating, treating and drying steps.

The means for coating or the means for treating or both conveniently comprise one or more spray nozzles provided with means for

forcing liquid therethrough. It is also possible for one or both of these means to consist of tanks for containing liquid positioned in relation to the conveyor system so that meat products are conveyed through the liquids in the tank.

The means for drying the products with coagulated coatings is preferably a device which is adapted to direct a blast of cold air, which may be preceded by a blast of hot air to hasten drying, over the wet products.

The conveyor system is ordinarily made up of a plurality of separate conveyors, preferably endless belt conveyors, arranged in tandem, each of the aforesaid means being associated with a separate conveyor. Such an arrangement lessens the contamination of the conveyor system which would be liable to occur by mixing of the solution of coagulable substance and the coagulating agent if, for example, a single conveyor belt were used. To reduce still further the risk of contamination, it is desirable to provide means for draining liquid from the products as they pass from one conveyor to the next. A system of spaced rollers over which the wetted portions travel is the preferred device for accomplishing this end.

One important practical embodiment of the invention is apparatus for the continuous manufacture of sausages and like meat products with edible artificial skins, in which apparatus of the aforesaid kind is combined with a conventional meat extruder, which is preferably (when sausages are to be made) one of the kind comprising a portioning device, and a cut-off device attached to the said extruder and adapted to cut the extruded meat into shaped portions, the extruder and cut-off device being positioned to feed shaped portions *via* the conveyor system to the means for coating. The cut-off device is best constructed in the way described and claimed in my copending divisional Application No. 27881/62 (Serial No. 967,502) to which reference is made for a detailed description of two preferred forms of cut-off device for use in the manufacture of rectangular hamburgers and sausages respectively.

A preferred form of apparatus of the invention is shown in the single Figure of the accompanying drawing, which represents a diagrammatic side view of the apparatus.

The apparatus comprises a cut-off device 41 attached to a conventional portioner filler 40 of known kind which extrudes sausage meat in shaped sausage portions through the cut-off device. A continuous belt conveyor 42 collects the sausage portions which are sprayed *via* spray nozzle 43 while on the conveyor with a solution of an edible coagulable substance (e.g. sodium alginate). It is convenient for the edges of the belt immediately beneath the spray nozzle to be bent up-

wards by rollers (not shown) so that the belt is U-shaped at this place. Such an arrangement helps to improve the coating of the sausage portions with the sprayed solution. Excess of the said solution runs back into a tank 45 *via* a draining tray 46. The spray nozzle 43 is fed from the tank 45 by the pump 44. On leaving the conveyor 42, the coated sausage portions run along the rollers 47a and 47b (which are preferably driven) on to the conveyor 48 which runs beneath a series of sprays 51 for the coagulating agent supplied by pump 54. The sausages with coagulated coatings pass from conveyor 48 to conveyor 49 *via* rollers 50a, 50b (which are preferably driven) and are carried thereby through a tunnel 52 in which the sausages are dried by draughts of hot and then cold air supplied from pump 55 through pipes 53.

In the drawing the conveyors are shown as being in line and this arrangement will generally be preferred. However, in practice it may often be desirable to have the conveyors at right angles to one another, for example, to make the apparatus more compact.

The invention includes within its scope a process for covering shaped sausage portions and other meat products with edible artificial skins using apparatus of the above-described type which comprises feeding the meat products to the conveyor system, coating the products with a solution of an edible coagulable substance, treating the coated products with a coagulating agent, and thereafter drying the products with coagulated coatings, the coating, treating and drying steps being all performed while the products are being conveyed by the conveyor system.

A particularly preferred form of process in accordance with the invention making use of the apparatus for the continuous manufacture of sausages and like meat products comprises forming meat into shaped portions by extrusion from the extruder through the cut-off device, feeding the portions to the conveyor system, coating the portions with a solution of an edible coagulable substance, treating the coated portions with a coagulating agent, and thereafter drying the portions with coagulated coatings, the coating, treating and drying steps being all performed while the products are being conveyed by the conveyor system.

The edible coagulable substance is preferably a $\frac{1}{2}$ to 5% solution of sodium alginate and the coagulating agent is preferably a solution of calcium chloride of at least 5% strength, e.g. 10%. The solutions are preferably sprayed on to the meat products, as this allows a high speed of operation. Excess of sodium alginate solution is allowed to drain from the products before the calcium chloride solution is applied.

130

Typical times for the various steps in this procedure are as follows. On the first conveyor the ratio of the time during which the portions are sprayed on the time during which they drain is about 1:5. Thus, they may be sprayed for one, and drained for five seconds. The portions are transferred to the second conveyor where they are sprayed with coagulating agent and on which they remain for about 25 seconds. Finally they are dried with a stream of hot air followed by a stream of cold air for about a minute.

In my Specification No. 902,100, I have described and claimed a process for the coating of cooked meats and fish and foods agglomerated into the form of sausages which comprises coating the said foods with a liquid containing a water-soluble alginate and thereafter coagulating the said alginate by treatment with calcium chloride.

In my Specification No. 923,680, I have described and claimed a process for the coating of uncomminuted raw meat and uncomminuted raw fish which comprises coating the said food with a liquid containing an alginate and thereafter coagulating the said alginate by treatment with an edible substance which coagulates the alginate to produce a continuous coherent layer. Preferably the alginate is sodium alginate and the coagulating agent is calcium chloride.

WHAT I CLAIM IS:—

1. Apparatus for covering shaped sausage portions and other meat products with edible artificial skins comprising means for coating the products with a solution of an edible coagulable substance, means for treating the coated products with a coagulating agent, means for drying the products with coagulated coatings, and a conveyor system positioned to receive the products initially and to convey the products during the aforesaid coating, treating and drying steps.

2. Apparatus as claimed in claim 1 in which the means for coating, or the means for treating, or both comprise one or more spray nozzles provided with means for forcing liquid therethrough.

3. Apparatus as claimed in claim 1 or 2 in which the means for drying comprises means for directing a blast of cold air over the coated products.

4. Apparatus as claimed in claim 1 or 2 in which the means for drying comprises means for directing a blast of hot and then a blast of cold air over the coated products.

5. Apparatus as claimed in any of claims 1 to 4 in which the conveyor system comprises a plurality of conveyors arranged in tandem, the means for coating, the means for treating and the means for drying being each associated with a separate conveyor.

6. Apparatus as claimed in claim 5 in which the conveyors are endless belt conveyors.

7. Apparatus as claimed in claim 5 or 6 in which the conveyor associated with the means for coating, the conveyor associated with the means for treating, or both, are provided with means for draining liquid from the products before the products reach the next conveyor.

8. Apparatus as claimed in claim 1 substantially as hereinbefore described with reference to the accompanying drawing.

9. Apparatus for the continuous manufacture of sausages and like meat products with edible artificial skins comprising a conventional meat extruder, a cut-off device attached to the said extruder and adapted to cut the extruded meat into shaped portions, and an apparatus as claimed in any of claims 1 to 8, the extruder and cut-off device being positioned to feed shaped portions via the conveyor system to the means for coating.

10. Apparatus as claimed in claim 9 in which the cut-off device is as claimed in my Application No. 27881/62 (Serial No. 967,502).

11. Process for covering shaped sausage portions and other meat products with edible artificial skins using an apparatus as claimed in any of claims 1 to 8 which comprises feeding the meat products to the conveyor system, coating the products with a solution of an edible coagulable substance, treating the coated products with a coagulating agent, and thereafter drying the products with coagulated coatings, the coating, treating and drying steps being all performed while the products are being conveyed by the conveyor system.

12. Process as claimed in claim 11 in which the edible coagulable substance is sodium alginate and the coagulating agent is a solution of calcium chloride.

13. Process for covering shaped sausage portions and other meat products with edible artificial skins substantially as hereinbefore described.

14. Process for the continuous manufacture of sausages and like meat products with edible artificial skins using an apparatus as claimed in claim 9 or 10 which comprises forming meat into shaped portions by extrusion from the extruder through the cut-off device, feeding the shaped portions to the conveyor system, coating the portions with a solution of an edible coagulable substance, treating the coated portions with a coagulating agent, and thereafter drying the portions with coagulated coatings, the coating, treating and drying steps being all performed while the products are being conveyed by the conveyor system.

15. Process as claimed in claim 14 in which the edible coagulable substance is sodium alginate and the coagulating agent is a solution of calcium chloride.

16. Process for the manufacture of saus-

ages and like meat products substantially as hereinbefore described.

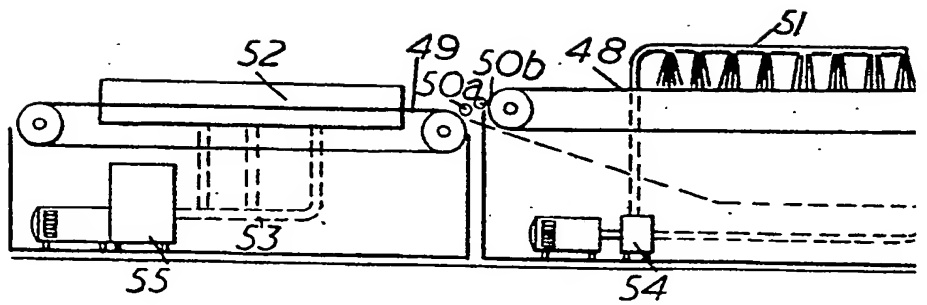
17. Shaped sausage portions and other meat products covered with edible artificial skins by the process of any of claims 11 to 13.

18. Sausages and like meat products

manufactured by the process of any of claims 14 to 16.

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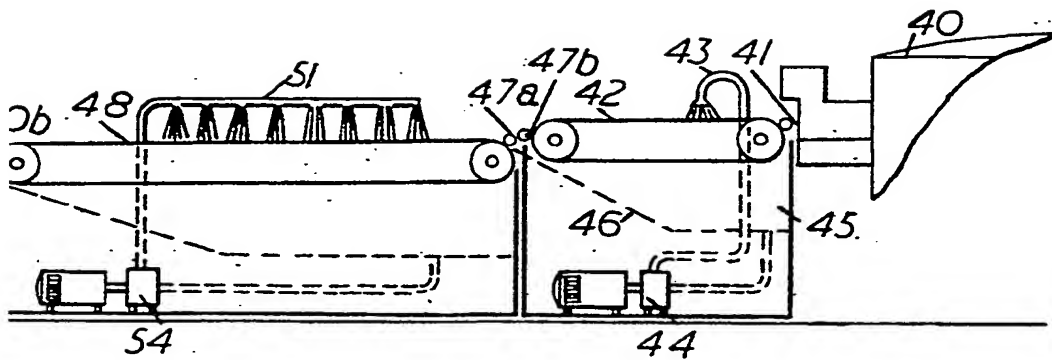


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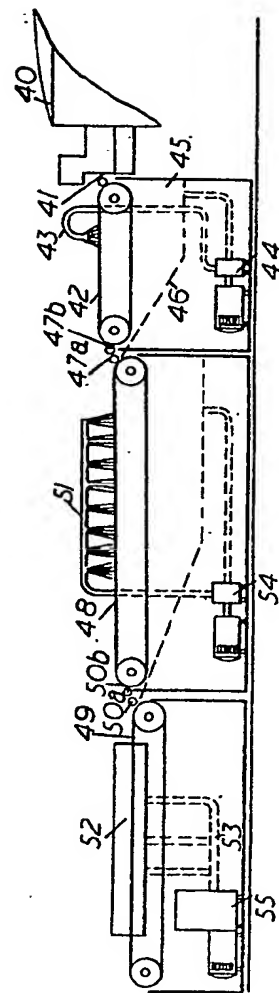
1. SHEET

COMPLETE SPECIFICATION

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the Original on a reduced scale.*



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